

Otay Valley Groundwater Basin

- Groundwater Basin Number: 9-18
- County: San Diego
- Surface Area: 6,830 acres (11.0 square miles)

Basin Boundaries and Hydrology

The Otay Valley Groundwater Basin is located adjacent the Pacific coast in southwestern San Diego County. The basin is bounded on the east by the San Ysidro Mountains, on the north and south by semi-permeable marine deposits, and on the west by the Pacific Ocean. Average precipitation ranges from 12 inches on the valley floor to 20 inches in the nearby upland areas.

Hydrogeologic Information

Water Bearing Formations

The primary water bearing units in this area consist of alluvium and San Diego and Otay Formations.

Alluvium. Quaternary alluvium yields water freely to wells that may discharge as much as 300 gallons per minute. However, the alluvium is too thin to be considered a viable aquifer because the thickness is not more than 50 feet (DWR 1986).

San Diego Formation. Coarse deposits within the Pliocene to Pleistocene age San Diego Formation form the primary water-bearing materials in the basin (DWR 1986; SDCWA 1997). The San Diego Formation consists of slightly- to moderately-consolidated, medium to coarse sand, silty sand, and clayey sand (Huntley and others, 1996). The formation is regional in extent and forms some of the most productive deposits in the Tijuana, Sweetwater Valley, and Mission Valley Groundwater Basins. These deposits generally thicken westward from about 100 feet east of La Nacion fault zone to as much as 1,400 feet near Tijuana (Huntley and others 1996), and average about 800 feet thick west of La Nacion fault zone (SDCWA 1997). Well yields range from 150 to 400 gpm (DWR 1986), though wells in the same formation yield as much as 1,500 gpm (Huntley and others 1996). The average specific yield for this formation is approximately 10 percent (Huntley and others 1996).

Otay Formation. The Miocene to Pliocene age Otay Formation has not been extensively developed. These deposits consist of sand that is weakly cemented and moderately permeable layered within finer materials (Huntley and others 1996). The few wells drilled into this deposit yield from 10 to 50 gallons per minute (DWR 1986).

Restrictive Structures

La Nacion fault zone crosses the basin from north to south, in the eastern part of the basin. The San Diego Formation thickens westward across this fault (Huntley and others 1996).

Recharge Areas

The basin receives groundwater recharge from percolation of precipitation, stream-flow originating in the valley highlands, return of applied water, and rare releases from the Lower Otay Reservoir during flood conditions. The Otay River flows east to west through the valley toward the ocean, and numerous small lakes and ponds exist along the river's course (DWR 1986).

Groundwater Level Trends

Groundwater Storage

Groundwater Storage Capacity. Unknown.

Groundwater in Storage. Unknown.

Groundwater Budget (Type C)

Information is not available to construct a budget.

Groundwater Quality

Characterization. Groundwater in the coastal plain part of this basin has a sodium chloride character and ranges in TDS content from about 500 to more than 2,000 mg/L (DWR 1967). Groundwater in the eastern portion of the basin ranges from sodium-calcium bicarbonate-chloride to sodium-calcium chloride-bicarbonate in character (DWR 1967). Concentration of TDS in water from the San Diego Formation ranges from 342 to about 12,000 throughout the region (SDCWA 1997).

Impairments. Groundwater is rated marginal to inferior for domestic use in the coastal plain because of high TDS content and suitable in the eastern part of the basin (DWR 1967). Water is rated marginal to inferior for irrigation use for most of the basin because of high chloride concentrations (DWR 1967).

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: 1 – 1,000 gal/min	Average: 185 gal/min (81 Well Completion Reports)
	Total depths (ft)	
Domestic	Range: 70 – 1,400	Average: 432 feet (169 Well Completion Reports)
Municipal/Irrigation	Range: 22 – 1,735	Average 508 feet.

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
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Basin Management

Groundwater management:

Water agencies

Public San Diego County Water Authority

Private

References Cited

- California Department of Water Resources (DWR). 1964. *Ground Water Quality Survey of Lower Otay River Valley*. Report to San Diego Regional Pollution Control Board (No. 9).
- _____. 1967. *Ground Water Occurrence and Quality: San Diego Region*. Bulletin No. 106-2. 235 p.
- _____. 1986. *San Diego Region Ground Water Studies, Phase III. Memorandum Report*. 89-120 pp.
- Huntley, David, Biehler, Shawn, and Marshall, C. Monte. 1996. *Distribution and Hydrogeologic Properties of the San Diego Formation, Southwestern San Diego County*. San Diego Formation Task Force Report of Investigation. Volume I. 65 p.
- San Diego County Water Authority (SDCWA). 1997. *Groundwater Report, June 1997*. San Diego, California.

Additional References

- California Department of Water Resources (DWR). 1967. *Ground Water Occurrence and Quality: San Diego Region*. Bulletin No. 106-2. 235 p.
- Elliot, W.J. 1970. *Gravity Survey and Regional Geology of the San Diego Embayment, Southwest San Diego County, California*: Pacific Slope Geology of Northern Baja California and Adjacent California, Pacific Section AAPG, SEPM, And SEG. pp. 10-22.

Errata

Substantive changes made to the basin description will be noted here.